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ABSTRACT

Project COULD (Career Orientation Utilizing Language Development) was developed as a means of building skills, knowledges, and attitudes on elementary children's previously acquired backgrounds. Children learn to speak the grammar and vocabulary characteristic of the language heard most frequently at home and in the immediate environment. Each unit of this instructional guide is designed to promote vocational awareness, exploration, and language development. The information in this unit on lumbering ecology was prepared for use at the seventh grade level for an approximate period of four weeks. It is divided into eight sections: a summary, an outline of the entire set of units for the category of lumbering, Project COULD's goals, a list of the performance objectives, a vocabulary list, suggested learning activities, numerous resource materials (films, filmstrips, transparency sets, instruction sheets, pamphlets, books, records, slides, resource people, and a resource outline questionnaire), and background information on the lumber industry (job and process flow charts, job summaries, and suggested teacher reading). (Author/BP)

ED 098355
CE 002 435
CAREER ORIENTATION UTILIZING LANGUAGE DEVELOPMENT

PROJECT COULD

AN ESEA, TITLE III PROJECT SERVING COOS COUNTY, OREGON

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L#5
LUMBERING ECOLOGY
GRADE 7

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1973

PROJECT COULD

CAREER ORIENTATION UTILIZING LANGUAGE DEVELOPMENT

A PACE PROJECT

Elementary and Secondary Education Act of 1965

Project COULD was developed as a means of building skills, knowledges, and attitudes upon elementary children's previously acquired backgrounds. Children learn to speak the grammar and vocabulary characteristic of the language heard most frequently at home and in the immediate environment.

A series of units of instruction were developed from the concepts and vocabulary of the industries indigenous to Coos County. The intention was to promote vocational awareness, exploration, and language development for the students in grades three through eight.

The information in this unit was prepared for use at the seventh grade level for an approximate period of four weeks.

Materials prepared by Project COULD are available from the IMC of Coos County Intermediate Education District, 2405 Colorado Street, North Bend, Oregon 97459.

SCHEDULE OF UNITS

Grade Level	Lumbering
Grade 3 Unit L #1	Logging
Grade 4 Unit L #2	Logging Transportation
Grade 5 Unit L #3	Wood Processing
Grade 6 Unit L #4	Marketing Wood Products
Grade 7 Unit L #5	Lumbering Ecology
Grade 8 Unit L #6	Coos County Careers in Lumbering

SUMMARY

This instructional guide is divided into eight sections. Each section is tabulated for easier use and quick reference.

Summary:
The intentions and reasoning for this program have been stated. For effective results, it is suggested that the teacher becomes totally familiar with the curriculum guide before beginning.

Outline:
This section gives an overall view of all of the sequenced units. Details of the information to be covered in this unit are specifically outlined.

Goals:
Objectives:

Activities:
These three sections are sequentially integrated to clearly define what activities are suggested for a particular objective and a particular concept. Each goal is numbered to correlate directly with objectives, activities and resources.

Vocabulary:
All terminology found in the unit, including particular occupations, is included in this section. Each term is defined. These definitions are intended for teacher use only.

Resources:
Locally produced material, Coos County resource people, books, pamphlets and commercially prepared media are listed with reference made to activity correlation.

Background:
This section contains additional material for teacher use.

LUMBERING ECOLOGY
UNIT L #5 OVERVIEW

The following outline represents the scope of the entire set of units (grades 3-8) for the category of LUMBERING. Only the outline for this unit is in its completed form.

SUGGESTED TIME: FOUR WEEKS
Jobs in Environmental Quality Control: 3 days
Technical Terminology: 13 days
Methods of Environmental Control: 11 days
Economic Influences: 4 days

(UNIT L #1) LOGGING
- A. The many jobs of the logger
- B. Logging terminology relating to the jobs of the logger
- C. Two main types of logging shows
- D. Environmental factors affecting logging
- E. Influence of logging on the economy

(UNIT L #2) LOGGING TRANSPORTATION
- A. Jobs in Log transportation
- B. Terminology relating to jobs in logging transportation
- C. Two main methods of log transportation
- D. Environmental factors affecting transportation
- E. Influence of log transportation on the economy

(UNIT L #3) WOOD PROCESSING
- A. The many jobs of the millworker
- B. Terminology relating to the jobs of the millworker
- C. Three main types of milling processes
- D. Environmental factors
- E. Influences of the lumber processing industry on the economy

(UNIT L #4) MARKETING WOOD PRODUCTS
- A. Jobs in marketing
- B. Marketing terminology
- C. Wholesale and retail markets
- D. Environmental factors
- E. Economic relationships

(UNIT L #5) LUMBERING ECOLOGY
- A. Workers involved in environmental quality control
  - 1. Foresters
  - 2. Engineers
    - a. Axeman
    - b. Rear Chainman
    - c. Head Chainman

OUTLINE

d. Transit Operator
e. Party Chief
f. Levelman
g. Rodman

3. Paper Production
   a. Lab Statistician
   b. Lab Stenographer
   c. Lab Technicians
   d. Technical Superintendent
4. Particle Board Production
   a. Preparation Operator
   b. Handyman
   c. Mat Operator
   d. Press Operator
   e. Lift Truck Driver
   f. Sanderman
   g. Tallyman or Strapper
   h. Laborer
5. New Methods
   a. Helicopter
   b. Balloon
   c. High Line

B. Technical terminology relating to environmental quality control (See VOCABULARY section of this unit)
C. The different methods used to control the quality of the environment in Coos County
D. The ways in which the quality of the environment affects the economy of the County

(UNIT L #6) COOS COUNTY CAREERS IN LUMBERING

A. Opportunities for employment
B. Occupational interest inventory
C. Steps in applying for a job
D. The job interview
E. Employment vocabulary

GOALS

1. To make the students aware that protecting the environment of Coos County provides various opportunities within the lumber industry for employment on a full and part time basis.

2. To make the students aware that people working within the lumber industry to protect the environment of Coos County use a unique set of terms to facilitate communication.

3. To make the students aware that people working in the various areas of the lumber industry use different methods to help protect the environment.

4. To make the students aware of the correlation between economic problems and environmental conditions of lumbering in Coos County.

The intention of Project COULD units is to utilize the language arts areas of reading, writing, listening, and speaking, as the vehicles to promote vocational awareness and exploration. It is not to dictate language arts curriculum, but to suggest that the vocational areas under consideration do have unique languages and concepts.

It is assumed that the language development aspect of the activities will be commensurate with the on-going language arts programs of the students participating in the various units prepared by COULD.

PERFORMANCE OBJECTIVES

1. Each learner will make at least one relevant contribution to a discussion in which the occupation titles involved in protecting the ecology and environment in the lumber industry are listed and grouped in meaningful groups. The teacher will judge the relevancy of each learner's contribution and the time span of the discussion.

2. Each learner will complete the crossword puzzle with eighty percent accuracy, by writing the words to match the definitions given as clues, within a time span set by the teacher.

3. Given a choice between engineering, forestry, by-product manufacture and new and experimental logging techniques, each learner will choose one to defend in an informal class debate which seeks to answer the question: "Which job category is most helpful in preserving our forests?" Each learner will tell what his choice is, why he chose that occupation group, and be able to answer questions about his choice. The teacher will judge whether each learner meets the criteria, and the time span of the discussion.

4. Given thirty minutes, each learner will write an essay with the following criteria:

   A. Which area of the lumbering industry needs the most improvement? Why?

   B. Does the problem involve economics? How? Why?

   C. Does the problem involve the environment? How? Why?

   D. Is any industry doing anything to solve the problem? How?

   E. What would you do to make improvements?

   The teacher will judge the competency of each essay.

VOCABULARY AND SPELLING

In this unit 60 vocabulary words and 20 key occupations are discussed. These words and occupations can and should be used as a part of the spelling program in the classroom. You as the teacher, are the best judge as to how this should be done in your classroom. No matter how you approach the matter remember that it is just as important to know how to spell the word as it is to know how to use it correctly in speaking.

MASTER VOCABULARY LIST

A permanent listing of all current vocabulary words should be available to the students at all times during the study of Ecology. Having this list of words and their definitions readily available to the students on charts, the overhead projector, the blackboard or a vocabulary notebook will provide the students with an immediate reference, should the need arise. A professional in-depth type of definition will not be nearly as valuable to the students as one that they have written, discussed and put on the master list themselves. If a definition is to be useful, it must be easily understood by the students.

VOCABULARY

CALCULATOR	An electronic machine used to rapidly perform the functions of adding, substracting, multiplying, and dividing.
ECOLOGY	The pattern of relationships of organisms to their environment.*
ENVIRONMENT	Our surroundings in which we live and work.
POLLUTION	Materials which make our environment* physically impure or unclean.
THERMAL WATER POLLUTION	A type of pollution* caused by pumping heated water from boilers, etc. into the waterways causing their temperature to rise above its normal level. This may cause a number of problems to the plant and animal life living in the waters.
VISUAL POLLUTION	Materials in the environment* which are displeasing to the sight of the viewer.

NEW AND EXPERIMENTAL LOGGING METHODS

BALLOON LOGGING	Using a large helium filled balloon to lift logs from where they are cut to the landing. The balloon is anchored down by steel cables.
CARRIAGE	An apparatus similar to a cable car used to winch logs from the cutting site to the landing in the skyline system* of logging.
FALCON	An acronym for Forest, Advanced Logging and CONservation. A government sponsored project to develop and demonstrate logging systems that will have less effect on the environment, and will be economically feasible.
S-64 SKYCRANE	A helicopter made by Sikorsky which has been used in logging operations. It has a lifting capacity of 20,000 pounds, and averages 200,000 to 300,000 board feet of timber daily.
SKYLINE SYSTEM	A system of high cables used to bring logs to the landing without dragging them and scarring the ground.

*Defined in the vocabulary section

FORESTRY

COMMERCIAL THINNING	Selective cutting of the weaker and slower growing trees so that the remaining trees will have more food, water, and light. This is done at about age 25-40 years and the wood is used for lumber, plywood or pulp chips.
CONTAINERIZED SEEDLING (BULLET SEEDLING)	A plastic bullet 2-1/2 to 4-1/2 inches long in which a seedling 5 to 6 months old is placed in a mixture of sand and peat. With a special planting gun, the bullets are placed in the ground at a much faster rate than the conventional method of planting each individual tree in a bed dug by hand.
CROWN	The top of a tree.
CRUISING	A forester* goes out into the woods to survey the types of trees in a stand* and to measure the amount of lumber in them.
DECAY	Rot or disease which attacks trees.
DORMANT SPRAY	An aerial spray of diesel oil and two chemicals used to retard the growth of red alder. It is applied when the red alder buds are still in the dormant stage (not yet opened).
FOLIAGE SPRAY	An aerial spray designed to retard the growth of red alder, applied when the leaves have fully extended and causes the leaves to turn red.
HIGH YIELD FORESTRY	Weyerhaeuser Company's program of intensive forest management that will produce 33% more wood per acre than nature does. The key elements in High Yield Forestry are: 1. Prompt regeneration within one year after logging 2. Fertilization and pre-commercial thinning* 3. Commercial thinning* 4. Use of genetically superior planting stock.
NURSERY SEEDLING	Small trees about two years old that have been raised in a tree nursery. These trees are better able to withstand damage from weather and animals and have to compete less for light on the forest floor.
PRE-COMMERCIAL THINNING	Selective cutting of the trees at about 12 years of age so that the strongest trees will have more food, water and light to grow.

*Defined in the vocabulary section

REFORESTATION	Planting of seeds or nursery seedlings* in an area that has been logged off.
REPELLANT	A chemical placed on the seeds before broadcasting, which will deter rodents from eating them.
RESEEDING	To seed an area again. Used when the first seeding was ineffective.
ROTATION	The period of time between the planting of a seedling forest and its' harvest, usually 65 years.
STAND	A group of trees.
STAND CONDITION	The general condition of the timber in a stand* - how old the trees are, their diameters and whether or not they are diseased.
THINNING	Selective cutting of trees with little or no growth to salvage them and permit the remaining crop trees to grow faster.

PAPER PRODUCTION

BIOCHEMICAL OXYGEN DEMAND OR B.O.D.	Biological and chemical particles in the liquid effluent* which has the property of taking oxygen out of the surrounding water. If the B.O.D. of the effluent is too high, it will rob oxygen needed by the acquatic life for survival.
CHEMICAL OXYGEN DEMAND OR C.O.D.	Chemicals in the effluent* which have the property of taking oxygen from the surrounding water. C.O.D. is a part of B.O.D.*
EFFLUENT	The outflow from the paper making process containing stock losses*, dissolved solids and pulp liquor.
FINES	Very small wood fibers which are held in suspension by the movement of the liquid.
GROUND ABSORPTION	The amount of water and effluent* which seeps into the ground and through dikes.
HOLDING LAGOON	A pond of about 270 acres with an average depth of 5 feet. It is in this pond that the effluent* is stored for about two years thereby allowing it to absorb oxygen from the air and in this way decreases its' B.O.D.* to a level low enough to allow the effluent to be dumped into bays, rivers, and oceans.

*Defined in the vocabulary section

LIGNUN	Material in wood which holds the fibers together. This substance is somewhat like glue.
OUTFALL	The point at which effluent* meets the receiving body of water.
PH FACTOR	The amount of acid or base in the effluent*. Too much of either can be very damaging to the acquatic life.
PLUME	A plume shaped discoloration in clear water caused by effluent* being pumped into bays, rivers and oceans.
SETTLING BASIN	A large concrete tank, or impression in the earth where effluent* is stored. This storing allows the fines* that are in the liquid to come out of suspension and settle to the bottom of the tank. Every so often (from one to two months) the fines are dredged out of the basin.
SIDE HILL SCREEN	A screen mounted at an angle over which passes the effluent* from the U-pipe on its way from the mill to the settling basin. Large chunks of fiber, dirt, plastic and metal are removed by this screen which allows the liquid to seep through. From here the liquid goes to the settling basin. The large particles are used to make dikes and for landfill and mulch.
STOCK LOSSES	Fibers rejected during the cleaning processes or spilled during the various mill processes.
TURBIDITY	A measure of the amount of fines* held in suspension within the effluent*.

PARTICLE BOARD PLANT

CAUL	An aluminum sheet 51 inches by 101 inches on which the mat* is placed as it goes into the pressing machine.
CONVEYOR BELT	A continuous rubber belt on pullies used to transport planer shavings from one part of the plant to another.
HAMMER MILL	A machine with small hammers which revolve on a drum. Used to mill planer shavings to the proper size to be used in particle board.
MAT	The shavings after they have been mixed with the resin* and wax and spread out on the caul*, before it goes into the pressing machine.

*Defined in the vocabulary section

RESIN (UREA RESIN)	Used as a glue to hold the particles together. It is made from formaldehyde*. (See Chemical Plant)
SILO	A tall cylindrical tank used to store planer shavings and plywood trimmings before they are dried.
TALLY TICKET	Tells the number of sheets in the stack, its dimensions and grade. It is then placed with a finished stack of particle board after the metal straps are placed around it for shipping.

ENGINEERING

CHAIN	A steel tape used to measure distances between hubs*.
FIELD BOOK	A book in which records are kept of all sightings taken by the engineers.
HUBS	Stakes about 12" long with a pointed end. These stakes are pounded into the ground and a tack put in the top. The sighting is taken from this tack and also used for an end point in that leg of the measurement.
LEVEL	A tripod on top of which are mounted two leveling bubbles and a magnifying telescope with vertical and horizontal cross hairs. Used to take the readings from the level rod* in calculating elevations.
LEVELS	The differences in elevation between two points.
LEVEL ROD	A large wooden rod which can be extended to certain heights and is graduated into feet, tenths of feet and hundredths of feet. Used to help calculate elevations.
PLUMB BOB	A tear drop shaped piece of metal which is hung by a string. When the point of the tear points to the tack, the Transit Operator* knows that the instrument is directly over the mark and he can take another reading.
SECTION	One square mile of land.
SETTING	A major area that is being surveyed and mapped for logging.

*Defined in the vocabulary section

STAFF COMPASS — A stake with a compass mounted on top. The compass has a 3-1/2" needle on the face, a protractor and two sights for establishing direction. Used sometimes in areas where less accurate measurement is needed that would be given by a transit*.

TRANSIT — An instrument used to measure horizontal and vertical angles. Composed of two protractors and magnifying telescope mounted on a tripod from which hangs a plumb bob*.

*Defined in the vocabulary section

KEY OCCUPATIONS

FOREST ENGINEERING:

AXEMAN	Cuts a path through the underbrush for chaining*.
HEAD CHAINMAN	Gives sights and is responsible for assuring that the chain* is taut and clear of obstacles. May use an axe to place the next hub* from which distances and angles will be measured.
INSTRUMENT MAN	Also known as Transit Operator. Sets up and levels the transit* using the plumb bob* to insure exact placement of the instrument over the tack on top of the hub*. Uses the transit to measure vertical and horizontal angles and makes field computations using trigonometry.
PARTY CHIEF	In charge of the transit* crew making the survey. Sets the work pace for the crew and gives directions.
REAR CHAINMAN	Holds the end of the chain* nearest the Instrument Operator* and pulls it taut for accurate measurement.
ROAD SURVEY TEAM: LEVELMAN	Sets up and levels the instrument. Records the readings and uses addition and subtraction to calculate elevations. Gives hand signals to the rodman* and moves the instrument to the next hub* or marker.
ROAD SURVEY TEAM: RODMAN	Uses an axe to drive the hubs* into the ground and holds the level rod* vertically over the hub. Raises and lowers or tilts the rod upon hand signals from the levelman*; moves his equipment to the next sight or marker.
FORESTER (SILVICULTURALIST)	(Forester is a broad term encompassing a long list of forest related jobs all the way from entomologists to smoke jumpers. We are including the definition of what is commonly called a Forester, but what is actually the job of a Silviculturalist.) Decides which stands* of timber are ready to be cut to provide wood products demanded by the consumer through the use of helicopters, aerial photographs and ground reconnaissance. He is in charge of intensive forestry practices and reforestation* of logged areas.

*Defined in the vocabulary section

PAPER MILL:

LABORATORY STATISTICIAN	Collects, calculates and interprets information on rainfall, evaporation and ground absorption* from the lagoon, water fed into the lagoon and stock loss*. Uses a calculator* to help interpret figures and plots these figures on a chart.
LABORATORY STENOGRAPHER	Types, files and does calculations on the different reports to be made. Collects and files technical reports and types correspondence.
LABORATORY TECHNICAL SUPERINTENDENT	Supervises all workers in the department. Collects the effluent* to be sent to the chemical testing company for tests of C.O.D.*, total oil and grease, color and turbidity*.
LABORATORY TECHNICIAN	Collects samples for, and performs chemical type testing for B.O.D.*, temperature and PH* of effluent.

PARTICLE BOARD PLANT:

HANDYMAN	In charge of the glue mixing section of the plant where the particles are mixed with the resin* and wax. Also relieves the Press Operator* and the Mat Operator* for their breaks, so must know their jobs also.
LABORER	Responsible for keeping the work area clean from shavings. Helps the other operators when needed.
LIFT TRUCK DRIVER	With the fork lift truck, removes the stacks of particle board from the press area to the rough storage area or takes them to be put into the trimmer saw. Also takes the finished product from the sander to the shipment area.
MAT FORMER (OPERATOR)	Operates the machine which spreads the shavings mixed with the resin* and wax onto the cauls*. Checks the percentages of resin and wax in the mat*, and also checks the weight of each mat.
PREPARATION OPERATOR	Receives the raw material and is responsible for drying the shavings and mixing them in the proper proportions with trimmings from the plywood mill. Operates the hammer mill* and checks the storage silo* levels.
PRESS OPERATOR	Operates the pressing machine, controlling the temperature and pressure. Responsible for the mat* as it unloads from the caul*, and also the cooling process as the mats leave the pressing machine.

*Defined in the vocabulary section

SANDERMAN	Operates the saws which trim the boards to 4 feet by 8 feet, and the sander which finishes the product. Responsible for adjusting the sander and saws and changing the sander belts.
TALLYMAN (STRAPPER)	Places metal bands around stacks of finished particle board, and places the tally ticket* on each stack.

*Defined in the vocabulary section

RESOURCE PEOPLE LISTED IN THE RESOURCE SECTION OF THIS UNIT SHOULD BE CONTACTED AT LEAST ONE WEEK IN ADVANCE OF THEIR VISIT. THEY SHOULD HAVE AVAILABLE AN OUTLINE OF THE MATERIAL YOU WISH COVERED AND A LIST OF ANY EQUIPMENT YOU WOULD LIKE THEM TO BRING. (IF ONE OF THE STUDENT'S FATHERS COULD BE USED AS A RESOURCE PERSON, THIS MAY BE BENEFICIAL TO THAT STUDENT AND THE CLASS AS A WHOLE.)

THE TEACHER WILL NEED TO BRING THE FOLLOWING EQUIPMENT FOR USE IN THE UNIT:

AMPLE SUPPLY OF 5" X 8" CARDS

AN ASSORTMENT OF NEWSPAPER CLIPPINGS AND MAGAZINE ARTICLES ABOUT ECOLOGY AND ENVIRONMENT

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1st	1-A 1-B 2-A 1-C 1-D	1-E 1-F 1-G	3-A 3-B	1-H (Test for Obj. 1)	3-C 3-D 3-E 3-I 2-D
2nd	3-C 3-D 3-E 3-I 2-D	3-C 3-D 3-E 3-I 2-D	3-C 3-D 3-E 3-I 2-D	3-C 3-D 3-E 3-I 2-D 3-F	3-F 2-C
3rd	3-G 2-C	3-G 2-C 2-B	3-H 3-J 3-K 3-L	3-M (Test for Obj. 3) 2-E	4-A 4-B 4-C
4th	4-D 4-E 4-F	4-G 4-H	4-I (Test for Obj. 4)	2-F 2-G	2-H (Test for Obj. 2)

The numbers on the calendar refer to activities on the following pages, which parallel objectives and goals. These are <u>suggested</u> activities in a <u>suggested</u> order, which the instructor is free to modify and/or improvise.

ACTIVITIES

1-A Begin this unit with a class discussion about ecology using procedures and questions such as the following:

Recently there have been many articles in the paper about ecology and the environment. Have any of you been reading these articles?
What were they about? (Accept volunteers from the class to tell what was in the articles.)
After each person tells about the article he or she has read, ask:
Does this article tell you what the word ecology means?
What is the difference between environment and ecology? (If necessary, allow the students to look up the definitions in a dictionary. Then write the words and their definitions on the chalkboard or overhead projector.)
Do you think there are people employed by the lumber industry to work on environmental problems?
What might their jobs be? (List the students' ideas on the chalkboard or overhead projector.)

ALTERNATE ACTIVITY: Begin this unit by passing out the newspaper clippings on ecology to the students. Instruct the class to read the articles. Then accept volunteers to tell about their article. Then ask questions such as the following to help the class begin thinking about occupations in the lumber industry dealing with environmental quality control:
What was your article about? (Accept volunteers from the class to tell what was in their articles.)
After each person tells about the article he or she has read, ask:
Does the article use the word ecology or environment?
Can you tell the class what these words mean?
What is the difference between environment and ecology? (If necessary, allow the students to look up the definitions in a dictionary. Then write their definitions on the chalk board or overhead projector.)
Do you think there are people employed by the lumber industry to work on environmental problems?
What might be their jobs? (List the students' ideas on the chalkboard or overhead projector.)

1-B Inform the class that they are going to see a sound filmstrip entitled JOBS IN LUMBER ENVIRONMENTAL QUALITY CONTROL, which will help them see if there are others besides those they listed that might be involved in this work. Below is a list of the jobs described in the filmstrip:

Engineering:
- Axeman
- Head Chainmen
- Instrument Man
- Party Chief
- Rear Chainman
- Road Survey Team: Levelman
- Road Survey Team: Rodman

Forester (Silviculturalist)

Paper Mill:
- Laboratory Statistician
- Laboratory Stenographer
- Laboratory Technical Superintendent
- Laboratory Technician

Particle Board Plant:
- Handyman
- Laborer
- Lift Truck Driver
- Mat Former (Operator)
- Preparation Operator
- Press Operator
- Sanderman
- Tallyman (Strapper)

1-C View the COULD prepared sound filmstrip entitled JOBS IN LUMBER ENVIRONMENTAL QUALITY CONTROL.

1-D FOLLOW UP: Accept volunteers from the class to name occupations discussed in the filmstrip. List these on the chalkboard or overhead projector. Allow the class to discuss similarities and differences between the jobs such as indoor and outdoor jobs, part-time and full-time jobs, etc.

1-E If the class has not already mentioned the ecology based, experimental methods of logging: helicopter, balloon and high line logging; focus their attention in this area by asking if they have heard of any new methods of logging that are being tried to help prevent erosion and unnecessary road building. Tell them you have a film which was made as a television newsreel to introduce helicopter, balloon, and high line logging. Instruct the class to watch for any jobs that might be available if these techniques were to become common practice. (See BACKGROUND for information on the FALCON program)

1-F View the newsreel entitled FALCON. Select a student to act as newscaster to read the script. This student should be allowed to preview the film and practice.

1-G FOLLOW UP: Ask the class to list any jobs they think might be available if helicopter, balloon and high line logging were to become common practice. Write these on the chalkboard or overhead projector.

1-H EVALUATION ACTIVITY
(TEST FOR GOAL AND OBJECTIVE 1)
MATERIALS NEEDED: a list of the students in the class to keep track of their contribution to the discussion; lists of the occupations from Activities 1-D and 1-G on the chalkboard or overhead projector.

OBJECTIVE 1: Each learner will make at least one relevant contribution to a discussion in which the occupation titles involved in protecting the ecology and environment in the lumber industry are listed and grouped in meaningful groups. The teacher will judge the relevancy of each learner's contribution and the time span of the discussion.

(Ask the class if any of the occupations listed would seem to go together. Write their suggestions on the chalkboard or overhead projector. If two students disagree, allow them a reasonable time to debate. If at the end of that time the class cannot decide where that occupation should go, place it in both groups. Any reasonable grouping should be allowed as long as the student can explain why he would place it there. When all the occupations have been placed in groups, ask the class to suggest titles for these groups.)

ACTIVITIES

2-A Hand out a list of the vocabulary words as listed in the VOCABULARY sections of this unit. Instruct the students to define the words as they appear during class reports, movies and individual research. (On the following page is a listing of the vocabulary words from which a thermal master can be made.)

2-B ENRICHMENT ACTIVITY: GAME: COLLEGE BOWL

Teacher Preparation--Make two different colored sets of all vocabulary words to be defined on 5" x 8" cards, one word to a card.
Objectives----------To see which team, at the end of the game, has the most points.
Procedures----------Divide the class into two teams. Hand out the word cards, one color for each team, one card at a time to each student until all cards are gone. Give a definition orally to the class. If a student has the card with the correct word on it, he may answer the question. If he thinks he has the right card, he may also try.
Rules----------To be able to answer, the student with the card must stand up and say "CALL!" In this way the teacher sees and/or hears the first person to stand on each team. If the answer given by the first person to stand and say "CALL" is correct, his team gets the point. If he misses the question, the first person who called on the other team gets a chance to answer. If he is correct, his team gets the point. If both players give incorrect responses, the definition is given again later on in the game.

2-C As the groups discuss in preparation for their panel discussion, instruct them to select one of the following methods for presenting the vocabulary words and their definitions to the rest of the class: (List these ideas on the chalkboard or overhead projector.)
Make up a ditto master to be run off by the teacher or secretary.

Write the words and definitions on the chalkboard before the report. Refer to the words during the discussion.

Write the words on the overhead projector along with their definitions. Refer to the words during the discussion.

Print the words and definitions on strips of butcher paper or tag board and tape them to the board as the words are used during the discussion.

NOTE: This activity correlates with Activity 3-F.

2-D ENRICHMENT ACTIVITY: Include the words and their definitions in a folder along with the report from Activity 3-F.

VOCABULARY

CALCULATOR

ECOLOGY

ENVIRONMENT

POLLUTION

THERMAL WATER POLLUTION

VISUAL POLLUTION

(NEW AND EXPERIMENTAL LOGGING METHODS)

BALLOON LOGGING

CARRIAGE

FALCON

S-64 SKYCRANE

SKYLINE SYSTEM

(FORESTRY)

COMMERCIAL THINNING

CONTAINERIZED SEEDLING (BULLET SEEDLING)

CROWN

CRUISING

DECAY

DORMANT SPRAY

FOLIAGE SPRAY

HIGH YIELD FORESTRY

NURSERY SEEDLING

PRE-COMMERCIAL THINNING

REFORESTATION

REPELLANT

RESEEDING

ROTATION

STAND

STAND CONDITION

THINNING

(PAPER PRODUCTION)

BIOCHEMICAL OXYGEN DEMAND or B.O.D.

CHEMICAL OXYGEN DEMAND or C.O.D.

EFFLUENT

FINES

GROUND ABSORPTION

HOLDING LAGOON

LIGNUN

OUTFALL

PH FACTOR

PLUME

SETTLING BASIN

SIDE HILL SCREEN

STOCK LOSSES

TURBIDITY

(PARTICLE BOARD PLANT)

CAUL

CONVEYOR BELT

HAMMER MILL

MAT

RESIN (UREA RESIN)

SILO

TALLY TICKET

(ENGINEERING)

CHAIN

FIELD BOOK

HUBS

LEVEL

LEVELS

LEVEL ROD

PLUMB BOB

SECTION

SETTING

STAFF COMPASS

TRANSIT

2-E ENRICHMENT ACTIVITY: Game: WORD DOWN

Teacher Preparation--None
Objectives----------The object of this game is to see which team, at the end of the game, has the most members still standing.
Procedures----------Divide the class into two equal teams. Each team stands in a line facing the other on opposite sides of the room. A word or definition is given orally by the teacher to the student at the head of the line of first one team and then the other. If the correct answer is given, a word or definition is given to the first person in line on the other team. The next set of questions would be given to the second people in each line and so on until the end of the line is reached. At this time the process begins all over.
Rules----------If the player being questioned gives the correct answer, he remains standing. If the response is incorrect, he must sit down. If neither player gives the correct response, both must sit down and someone already sitting is given a chance to answer. If he is correct, he rejoins his team at the end of the line.

2-F In a class discussion, ask questions such as the following to help the students begin thinking about how crossword puzzles are constructed:

Have any of you ever worked a crossword puzzle? (Ask for a show of hands.) What things make up a crossword puzzle? (Lines from a grid, across and down definitions, blackened squares, etc.)

Draw a grid on the chalkboard or overhead projector and list five to ten words from the VOCABULARY section of this unit. Ask volunteers to place the words somewhere within the grid. Remind them that the letters must form words both across and down. Fill in all the unused squares. When the words have been placed in the grid, number the across words, then the down words by placing numbers in the boxes containing the first letter of each word. Ask for volunteers to write out or tell the definition to first the across words and place them on the chalkboard or overhead projector. Repeat the procedures with the down words.

2-G Give each student two pieces of graph paper with 1/2" squares. Tell them they are going to construct crossword puzzles, from which you will make a test on the vocabulary words. Give them the following instructions on the chalkboard, overhead projector or orally:

a. Select at least ten words from the vocabulary list.
b. Print these words on the bottom of each piece of graph paper. Be sure to make the letters dark.
c. Draw the lines of the puzzle. Make them heavy.
d. Put the words in the squares you have drawn.
e. Number the box containing the first letter of each across word.
f. Number the box containing the first letter of each down word.
g. Shade or X in all the unused squares with pencil.

h. On a separate sheet of paper, list the definitions for all the across words and number them to fit the puzzle.
i. Do the same for the definitions for the down words.
j. Copy your puzzle on the other sheet of graph paper but this time leave out the letters so your puzzle will be blank.

Instruct the students to exchange their puzzles and definitions with someone else. Complete the other person's puzzle with a pen (this is important so that you may use the puzzle to make a thermal master and the ink will not show, if you choose to use it for the Evaluation Activity).

2-H EVALUATION ACTIVITY
(TEST FOR GOAL AND OBJECTIVE 2)
MATERIALS NEEDED: a ditto copy of the teacher-selected student-made puzzle for each student (the puzzle should be representative of the class and the unit's vocabulary).

OBJECTIVE 2: Each learner will complete the crossword puzzle with eighty percent accuracy, by writing the words to match the definitions given as clues, within a time span set by the teacher. (Be sure that each student understands the time limit, and let them begin.)

ACTIVITIES

3-A Ask questions such as the following to help the students conclude that they still lack information on how the lumber industry is working to solve problems of environment quality:

There is usually some sort of step by step process involved in any job. What is the process used by foresters to protect the environment? By the engineers? By the workers in the particle board plant? By the chemical plant operators? By the people working on environmental problems in the paper industry? (List on the chalkboard or the overhead projector.)
(Select two different steps in the process and then ask the following question:) Can this step come before this one? Why or why not?

3-B Suggest to the class that a more detailed study of these processes is needed. Place the four areas by product manufacture, forestry, engineering (surveying),and new logging methods on the chalkboard or overhead projector. Accept volunteers or assign students to research the process of environmental quality control in one of the four areas. Instruct the students to include in their written reports the following information:
The process used in this area to protect the environment.
A description of the jobs involved and any special equipment used.
An explanation of how the workers' jobs help protect the environment.

Provided in the RESOURCES section is a list of pamphlets, films and sound filmstrips that should be made available as the students begin their research.

3-C As the students research, they will find that not a great deal is written on this subject. Discuss with the class problems they are having gathering data. Suggest that a resource person might be able to give more information about the process used in this county. If the students feel this would be valuable, arrange for a resource person from that portion of the industry to visit the class. (NOTE: See RESOURCE section for a list of resource people and visitations outlines. Those students researching that portion of the industry would meet with that particular resource person. If four different people visit on the same day, arrange for each group to have its own meeting place so that they will not disturb others.) Some of the students might enjoy using a camera and/or tape recorder to record the activities during the visit. The students may use their own camera and tape recorders or those provided for school use. The students might also like to have the speaker join them for lunch. Another good idea would be to contact the local news media to inform them of the resource person's visit and demonstration time (if applicable), date and location. Many times they will send a photographer to record the visit for the general public. Don't forget any local TV stations in the area and do not be afraid to call! These people are always happy to obtain newsworthy articles and pictures. Be sure to clear this with your resource speaker as they may be bothered by photographers and newsmen.

3-D ENRICHMENT ACTIVITY: Some of the students might enjoy taking a field trip on their own or with the teacher, using a tape recorder and camera to gather first hand information. A good time to make arrangements would be during the resource person's visit (ACTIVITY 3-C).

A field trip schedule such as the following may be worked out if field trips can be scheduled on the same day: The first group of students will be let off at the beginning point of their field trip, and the bus will continue on. The second group, third group, and fourth group will each be delivered, then the bus will go back to pick up the first group, second group, third group and finally the fourth group. Each group will need a teacher or parent or principal to accompany them. The timing is also critical.
Encourage the children to bring their cameras along on the field trip and take pictures for personal use and use by the class. If the teacher wishes, his camera or one owned by the school can be used to record the field trip and the slides edited with an audio tape script for use in the panel discussion (ACTIVITY 3-F) or by classes in years to come. Also if the school, children, or teacher has a tape recorder, a student may be taught its proper use and operation and allowed to tape the guide on the field trip. Another good idea would be to contact the local news media and inform them of your planned trip(s), the date and the time. Many times they will send a photographer to record the trip for the general public. Don't forget any local TV stations and don't be afraid to call! These people are always happy to obtain newsworthy articles and pictures.

3-E ENRICHMENT ACTIVITY: Instruct the students to include in their reports, newspaper and magazine clippings, vocabulary and charts they wish to make in a notebook type of format. These notebooks can be displayed during open house or at PTA and PTSA meetings.
NOTE: This activity correlates with ACTIVITY 2-D.

3-F Instruct the students working in each of the four areas to discuss in groups their information and plan a panel discussion to present to the rest of the class. Their panel should consider the following points in planning the presentation: (List on the overhead projector or the chalkboard.)

Everyone should share part of the responsibility in presenting a step by step process.

Share the responsibility of describing the different jobs and their effect on the environment.

Select a method of presenting the vocabulary and definitions. (From those listed in ACTIVITY 2-C.)

Select and/or construct any charts, displays, films or slide presentations to be made before, during, or after the panel discussion.

Select a moderator who will make sure that everyone gets a chance to speak and will accept questions from the class and direct them to different panel members.
NOTE: This activity correlates with ACTIVITY 2-C.

3-G Panel discussion time. Allow the class to ask questions of the panel members. Also allow time for note taking on the information and vocabulary presented.

3-H ENRICHMENT ACTIVITY: The students might enjoy giving their panel discussion for another class of interested students or for a group of parents. If this is the case, arrangements should be made for a date and time.

3-I ENRICHMENT ACTIVITY: Some students may wish to work with the Art Instructor in designing and making environmental posters to be included with their report telling what the industry is doing to help save the environment.

3-J Discuss clearcutting with the class. Find out if they are aware of the recent controversy over clearcutting. List on the chalkboard or overhead projector any advantages they can think of for clearcutting. Then list any disadvantages for clearcutting. Tell them you have a tape about a recent discussion between people in favor of clearcutting and those not in favor of it. Tell the students to listen for any other advantages and disadvantages that they had not listed.

3-K Listen to the audio tape recording entitled THE CLEARCUTTING DEBATE.

3-L FOLLOW UP: List any other advantages and disadvantages for clearcutting the students may have derived from the tape recording. Allow them to discuss their own feelings about clearcutting.

3-M EVALUATION ACTIVITY:
(TEST FOR GOAL AND OBJECTIVE 3)
MATERIALS NEEDED: a class list to record each student's participation.
OBJECTIVE 3: Given a choice between engineering, forestry, by-product manufacture and new and experimental logging techniques, each learner will choose one to defend in an informal debate which seeks to answer the question: Which job category is most helpful in preserving our forests? Each learner will tell what his choice is, why he chose that occupation group, and be able to answer questions about his choice. The teacher will judge whether each learner meets the criteria, and the time span of the discussion. (Ask the class what occupation group, the engineers and road survey crews, the foresters, the by-product manufacturers, or the new and experimental loggers, they think is most helpful in preserving our forests. They do not necessarily have to defend the occupation group they researched for the panel discussion. Encourage each student to respond either to the original question or to another student's opinion. Encourage everyone to explain why they feel as they do.)

ACTIVITIES

4-A Introduce the speaker by explaining to the class that so far they have been studying only pollution and how the lumber industry in Coos County is trying to solve it. Ask the students questions such as the following to help them begin thinking about the effects of this pollution:

What types of pollution are there?
How does each affect the environment?
Does this pollution have any other effects other than making our environment impure or unclean? What are they?

4-B Introduce the speaker who will talk about ways in which the different types of pollution affects the ecology and economy of Coos County. Instruct the students to take notes listing the ways pollution affects or might affect in the future, the economy of Coos County. Ask the following question of the resource speaker and let the students discuss with him his ideas:

What can we do to help encourage the industry to continue to solve the problems of pollution?

4-C FOLLOW-UP: In a class discussion, accept volunteers from the class to list all the ways in which pollution does or might affect the economy of the county.

4-D Have the class consider the question: Is the problem of pollution one you are going to make the industry solve by themselves, or is there something you should do?

4-E View the 16MM sound film, A CASE AGAINST CHICKEN LITTLE.

4-F Discuss with the students the question: Is the problem of pollution one you are going to make the industry solve by themselves, or is there something you should do?

4-G The class probably is familiar with wigwam burners. Have a student explain what they are. Then lead the class in a discussion about why we don't see as many wigwam burners as we used to. Help them to conclude that the reason is probably as much or more economically based as it is environmentally based, by asking the following questions:

What was the wigwam burner used for? (burn waste products)
What is being done with these products now, since they are no longer being burned as much? (particle board, pulp mills, export, any of a large number of by-products)
If you owned a saw mill, would you rather burn your waste products or try to find something you could make out of them to sell? Why?

4-H Discuss the following in class: If the announcement were made that due to poor reforestation methods causing a tree shortage, the large mills in Coos County will shut down in five years. What affect might that have on:

Where you will be living. Why?
The cost of a new shirt or dress. Why?
The number of people who live in Coos County. Why?
What you will be doing after you finish high school. Why?
The cost of groceries. Why?

What might have been done to insure that there would have been enough trees for the future? What part of the lumber industry is doing the most now to insure trees for the future?

4-I EVALUATION ACTIVITY
(TEST FOR GOAL AND OBJECTIVE 4)
MATERIALS NEEDED: none

OBJECTIVE 4: Given thirty minutes, each learner will write an essay with the following criteria:

a. Which area of the lumbering industry needs the most improvement? Why?
b. Does the problem involve economics? How? Why?
c. Does the problem involve the environment? How? Why?
d. Is any industry doing anything to solve the problem? How?
e. What would you do to make improvements?

The teacher will judge the competancy of each essay. Write the above questions on the chalkboard or overhead projector. (Be sure each student understands the directions and the time limit.)

COULD PREPARED MATERIALS

	Activity No.
SOUND FILMSTRIPS	
Jobs in Lumber Environmental Quality Control	1-C
PAMPHLETS	
Jobs of Engineers in Environmental Quality Control	3-B,C,E,F,G,H
Jobs of Environmental Quality Control in the Paper Industry	3-B,C,E,F,G,H

RESOURCES

COMMERCIALLY PREPARED MATERIALS

		Activity No.
16MM SOUND FILMS		
Changing Forest	IED F1089	3-B,C,E,F,G,H
The Case Against Chicken Little	WYCO	4-E
Conserving Our Forests Today	IED F17	3-B,C,E,F,G,H
Your Career in Forestry	WYCO	3-B,C,E,F,G,H
16MM SILENT FILM		
The Falcon Project	IED	1-F
AUDIO TAPE RECORDING		
Clearcutting Debate (Cassette #17)	SWOCC	3-K

PRINTED MATERIALS

PAMPHLETS The following are for use as research in Activities 3-B,C,E,F,G,H

Careers in the Logging Industry
There's Nothing Wrong with Growing Timber
Should You Be a Forester
Our Forest Bank Account
A Vital Aspect of Forest Ecology: Clearcutting
The Forester in the Plaid Shirt
Patch From the Blue
A Job with the Forest Service
So You Want to be a Forester
The Good Lord's Made All the Land He's Ever Going to Make
In Your Service: The Work of Uncle Sam's Forest Rangers
The Weyerhaeuser High Yield Forest
Our Environment
The Wilderness: Just How Wild Should it Be
Let's Learn About the Forest
Forest Ecology and You
Forest Policies of the Society of American Foresters
Pulp, Paper and People
Wood, Pulp and Paper, and People in the Northwest
Wood in the Service of Man
Recreation and the Working Forest

BEST COPY AVAILABLE

RESOURCE SPEAKERS

The following people have consented to act as resource people. They should be contacted at least one week in advance of their visit to give them time to prepare for their presentation and gather materials needed.*

Name	Occupation	Employer	Phone No.
Tom Orr	Forester	WYCO Timberlands Div.	756-5121
Hank Repoeto	Engineer	WYCO Timberlands Div.	756-5121
Dave Sant	Public Relations	Weyerhaeuser	756-5121
Jim Baxter	Technical Superintendent	Menasha Paperboard Div., North Bend	756-5171
Bill Lansing	Research Forester	Menasha Land and Timber	756-4775
Archie Lewis	Particle Board Plant Supervisor	Weyerhaeuser	756-7511
Gerald Phillips	Forester (Information on new logging methods)	State Forestry Dept.	267-4136

*Some parents of students in your classroom may be able to serve you as resource speakers. If this is the case, they should be contacted.

RESOURCE PERSON: VISITATION OUTLINE: FORESTER

DATE OF VISIT: _____

TIME OF VISIT: _____

SCHOOL AND ADDRESS: _____

SCHOOL PHONE: _____

TEACHER: _____

TEACHER'S HOME PHONE: _____

A. If at all possible, the resource person should bring as much of the equipment used on the job as possible. The students will learn more about the equipment used and the job if they can see the tools. Things such as aerial photographs, increment bores, paint guns, computer print out sheets, diameter tapes, abney levels, elinometer, compass and flagging ribbon will help the students better visualize the equipment and its use. A demonstration of tree planting would be useful also plus any films or slides you have.

B. Points to discuss

1. Describe the job of a forester
2. Describe the process used by foresters to protect the environment
3. Tell why you became a forester
4. Tell what you like most about your job
5. Tell what you like least about your job
6. Tell about the working conditions
7. Tell about chances for promotion
8. Tell about your wages

C. Vocabulary words to cover with the students

1. Stand	5. Timber Cruising	9. Thinning
2. Stand Condition	6. Reforestation	10. Pre-Commercial Thinning
3. Decay	7. Nursery Seedling	11. Commercial Thinning
4. Crown	8. Repellant	12. Replanting

RESOURCE PERSON VISITATION OUTLINE: ENGINEER

DATE OF VISIT: _____

TIME OF VISIT: _____

SCHOOL AND ADDRESS: _____

SCHOOL PHONE: _____

TEACHER: _____

TEACHER'S HOME PHONE: _____

A. If at all possible, the resource person should bring as much of the equipment used on the job as possible. The student will learn more about the equipment used and the job if they can see the tools. Things such as a chain, hubs, plumb bob, tripod, transit field book, will help the students better visualize the equipment and its use. Also please feel free to use any films or slides you have.

B. Points to discuss

1. Describe the job of an engineer possibly surveying a portion of the school grounds
2. Describe the process used by engineers to protect the environment
3. Tell why you became an engineer
4. Tell what you like most about your job
5. Tell what you like least about your job
6. Tell about the working conditions
7. Tell about chances for promotion
8. Tell about your wages

C. Vocabulary words to cover with the students

1. Transit
2. Section
3. Setting
4. Staff Compass
5. Levels
6. Level Rod
7. Level (on equipment)
8. Field Book
9. Hubs
10. Plumb Bob

RESOURCE PERSON VISITATION OUTLINE: TECHNICAL SUPERINTENDENT
PAPER PRODUCTION

DATE OF VISIT: _____

TIME OF VISIT: _____

SCHOOL AND ADDRESS: _____

SCHOOL PHONE: _____

TEACHER: _____

TEACHER'S HOME PHONE: _____

A. If at all possible, the resource person should bring as much of the equipment used on the job as possible. The students will learn more about the equipment used and the job if they can see the tools. Things such as chemical testing equipment for PH, BOD, COD, turbidity, etc. as well as temperature will help the students better visualize the equipment and its use. Also feel free to use any slides and films you have.

B. Points to discuss

1. Describe the jobs of workers in the paper industry concerned with environmental quality control
2. Describe the process used by these people to protect the environment
3. Tell why you took your present job
4. Tell what you like most about your job
5. Tell what you like least about your job
6. Tell about the working conditions
7. Tell about chances for promotion
8. Tell about your wages

C. Vocabulary words to cover with the students

1. Holding lagoon
2. Stock losses
3. Settling basin
4. Side hill screen
5. Fines
6. Biochemical oxygen demand (BOD)
7. Effluent
8. PH factor
9. Chemical oxygen demand (COD)
10. Turbidity
11. Ground absorption
12. Lignun
13. Outfall
14. Plume

RESOURCE PERSON VISITATION OUTLINE: PARTICLE BOARD PLANT SUPERVISOR

DATE OF VISIT: _____

TIME OF VISIT: _____

SCHOOL AND ADDRESS: _____

SCHOOL PHONE: _____

TEACHER: _____

TEACHER'S HOME PHONE: _____

A. If at all possible, the resource person should bring as much of the equipment used on the job as possible. The students will learn more about the equipment used and the job if they can see the tools and some of the materials used. Things such as different thicknesses of particle board, sample of the planer shavings before and after they go through the hammer mill, a bottle sample of the urea resin, a bottle sample of the wax, etc., will help the students visualize the process. Also feel free to use any slides and films you may have.

B. Points to discuss

1. Describe the workers in the particle board manufacturing process
2. Tell why you took your present job
3. Tell what you like most about your job
4. Tell what you like least about job
5. Tell about the working conditions
6. Tell about the chances for promotion in the particle board plant
7. Tell about the pay for the various jobs in the plant

C. Vocabulary words to cover with the students

1. Mat
2. Caul
3. Silo
4. Tally ticket
5. Hammer mill
6. Resin (urea)
7. Wax
8. Conveyor belt

RESOURCE PERSON VISITATION OUTLINE: NEW AND EXPERIMENTAL LOGGING METHODS

DATE OF VISIT: _____

TIME OF VISIT: _____

SCHOOL AND ADDRESS: _____

SCHOOL PHONE: _____

TEACHER: _____

TEACHER'S HOME PHONE: _____

A. The resource person should bring as much visual information as possible. The students learn more about new concepts if they can see pictures or see the actual equipment involved. Feel free to bring any slides or films you have.

B. Points to discuss

1. The FALCON program
2. What has been done in our area with new logging methods
3. How does your job bring you into contact with new and experimental logging methods
4. What jobs may be available in the future in new logging methods

C. Vocabulary to cover with the students

1. S-64 Skycrane
2. Carriage
3. Skyline logging
4. Balloon logging
5. Helicopter logging

In the lumber industry, no worker can any longer ignore the quality of the environment. Each and every job deals with some aspect of ecology either directly or indirectly. The occupations covered in this unit are those which deal most directly with environmental quality control and are more full time occupations rather than part of another job.

There are agencies such as the Coos Forest Protective Association, the U.S. Forest Service and the Bureau of Land Management which also deal with environmental quality control and play a definite role in protecting the ecology of Coos County. They were excluded, however, since they are government agencies outside the lumber industry employment scene. Their jobs, however, are similar to the jobs of the large corporate foresters covered in this unit.

All three major corporations in Coos County employ from one to five men and women whose total job is to travel from area to area throughout the Western United States and solve problems of environmental pollution. Since these people are on a regional basis and not employed locally, a description of their work was omitted. But, it is reassuring to know that these people and their jobs do exist and have some local influence on the environment of our county.

But what are we really talking about when we speak of the environment and ecology?

The words "ecology" and "environment" are two terms that are much in the news today. We hear them used often, but don't really know what they mean. Ecology is that balanced system of patterns of relationships of organisms to their environment; the environment being the surroundings in which we live. If the ecological system is interrupted or changed by pollution of various types, the difference is not necessarily immediately noticeable, but it is nevertheless a difference.

For years people have been taking from the environment and not really paying any attention to what they have been doing to these systems. But now that the world is growing more and more crowded and the demand for nature's products is increasing, we are having to take a second look at the problems that we have caused in the past. It is to this search for solutions that this unit is directed.

As you will note in reading through the unit, it is not a condemnation of any portion of the industry, but an attempt to make the students aware that occupations are available to them within the lumber industry and that the industry really is actively involved in doing something about the quality of the environment in which we all live. After all, the industry is not the only one that should shoulder the blame. The American consumer has been demanding, and will continue to demand, more and more lumber products at a cheap price. In order to provide these products, the industry has had to make rapid as well as economical growth and this sometimes has not been in the best interest of the environment.

In teaching this unit, the teacher should keep these points in mind.

Following, are several lists which should help you in understanding the relationships of the jobs and where they appear in the process flow. Also you will find a resource book listed that would be well worth your while to read. It contains a short history of the logging industry and will help start you thinking about how much the industry has changed over just the past few years. The book can be found in your public library.

TEACHER RESOURCES

HIGH TIMBER: THE STORY OF AMERICAN FORESTRY by Charles I. Coombs

THE FALCON PROGRAM

FALCON is an acronym for Forest, Advanced Logging, and CONservation.
FALCON is aimed at solving the biggest single problem in American forestry today--how to meet expanding demands for timber products, and at the same time maintain a high quality forest environment. FALCON'S purpose will be to develop and demonstrate logging systems which, while economically feasible, will have less impact on the environment than systems presently available for the management of an estimated fifty million acres of commercial forest land in the United States requiring special timber harvest methods.
Emphasis on FALCON will be on developing and perfecting new or improved aerial logging methods such as balloons, helicopters, and skyline cable systems. All share the advantage of being able to transport the logs through the air, rather than having the material dragged across the ground. All have the advantage of requiring far less road construction, in comparison with conventional logging methods.
The FALCON proposal was drafted in the spring of 1971 by the U.S. Forest Service, with the cooperation and assistance of the Aerospace Corporation, a nonprofit, federally-financed "think-tank" research operation based in San Bernardino, California. The program, when fully funded, calls for an expenditure of about ten million dollars per year for five years. The effort will be directed by the Pacific Northwest Forest and Range Experiment Station, headquartered in Portland, Oregon. Although the initial attack will be in the Pacific Northwest, all U.S. Forest Service regions will be involved in the five-year program. Federal and State agencies, private landowners, and interested individuals and organizations will also be closely involved in both the development and execution of the program.
The national debate over clearcutting will also be a FALCON consideration. Although clearcutting is still the only satisfactory silvicultural method in many situations, partial cuts are an acceptable alternative in many other instances. Aerial logging systems offer the opportunity to employ partial cutting or to make smaller clearcuts where appearance of the cutover area is especially important.

PAPER MILLING INDUSTRY, PROCESS AND JOB FLOW CHART

1. Effluent goes from the paper machine and various places within the mill into the U drain or sewer type pipe.
2. It travels through this pipe until it gets to a Side Hill Screen where the larger fibers are screened out of the effluent.
3. The liquid part of the effluent and any suspended fibers are then fed into the Settling Basin where the liquid is allowed to set while the fines come out of suspension and drop to the bottom of the tank. About every two months this basin is dredged and the fines are used for fill, mulch and/or fertilizer on the dikes so that grass will grow and prevent erosion.
4. The effluent is then fed into the Holding Lagoon where it will be left for about two years to pick up or absorb air from the surface.
5. At this point, samples of the effluent are taken by the LAB TECHNICIAN and tested for suspended particles, BOD, PH, and total oxygen demand. He records the results of his tests which will be sent into the state.
6. This information is reviewed by the TECHNICAL SUPERINTENDENT and then passed onto the LAB STENOGRAPHER.
7. The LAB STENOGRAPHER types and assembles this information in report form, and files a copy for future reference.
8. The TECHNICAL SUPERINTENDENT again checks these records and gives them to the LAB STATISTICIAN.
9. The LAB STATISTICIAN takes this information and interprets it in graph form on a daily basis for use by the TECHNICAL SUPERINTENDENT in quality control checks and planning for mill machinery adjustment and refinements.
10. Monthly, the TECHNICAL SUPERVISOR collects one gallon of effluent and sends it to the chemical testing company to do tests on COD, total oil and grease, turbidity and color. These results are given to the LAB STATISTICIAN for charting. Every two years he also applies for an outfall permit from the state and U.S. Government. He fills out the forms from past records on the chemical characteristics of the effluent.

FORESTER AND ENGINEER JOB AND PROCESS FLOW CHART

1. FORESTERS determine what type of timber is in a stand, its age, species, grade and diameter from helicopters, aerial photographs and ground reconnaissance. Decides which stands of timber should be cut to provide wood products demanded of the consumer.
2. FORESTERS use timber cruising and aerial photographs to indicate approximate boundaries of the setting they would like to have logged and give this information to the ENGINEERS.
3. FORESTERS tell the Logging Superintendent at what date the cutters can be sent into the woods to fall the timber and at what date the timber should be yarded and transported.
4. The PARTY CHIEF gives direction to the men before they begin their work and may help with the recording of figures and field computation as well as setting the working pace of the crew.
5. ENGINEERS then take a survey team called a Transit Team into that area. The AXEMAN cuts a path through the underbrush for the chaining.
6. The REAR CHAINMAN holds the end of the chain nearest the INSTRUMENT OPERATOR and pulls the chain taut for accurate measurement.
7. HEAD CHAINMAN takes the chain out to the place where the measurement will be made and places the hub in the ground and the tack in the top of the hub. He then pulls the chain taut and makes sure that it is clear of all obstacles.

8. Meanwhile the TRANSIT OPERATOR sets up the tripod on top of which is the transit. He levels the equipment and uses the plumb bob to make sure that his instrument is placed properly. He then takes a sight using the cross hairs in the telescope with the tack. He records the verticle and horizontal angles in his field book and computes the distance between the two points.
9. FORESTERS tell the ENGINEERS about where they would like the fewest number of roads to reach the most timber.
10. The Road Survey crew follows the Transit Team and marks out the path the road will follow. The RODMAN holds the level rod for the LEVELMAN at one of the points marked by the Transit Team or uses an axe to pound a hub into the ground and places a tack in the top. He follows the hand signals from the LEVELMAN in getting the level rod verticle.
11. The LEVELMAN sets up his instrument usually at a spot which already has a known elevation. He looks through the telescope and lines up the cross hairs on the markings on the level rod. He records the elevation and carries the instrument onto the next marker or hub.
12. After a setting has been cut, yarded and the timber transported to the milling sight, the FORESTER cruises the area to determine how the area may best be prepared for reforestation by burning or by scarification.
13. The FORESTER then either contracts for or arranges for men in that company to plant that area. He may also contract for aerial or hand seeding or arrange for company men to do that job. (Reforestation is done within one year of the cutting.) Then he orders the nursery seedlings or seeds necessary to do the job.
14. Each year, the FORESTER will cruise the area to see if the trees are growing or if they have been choked out by weed growth and damaged by animals. If the latter is the case, they may order aerial spraying to kill the weeds or contract for reseeding or replanting. They may also order the area to be fertilized.
15. When the trees are about 12 years old, the area is again cruised and pre-commercial thinning may be ordered by the FORESTER.
16. When the trees are about 25-40 years of age, the FORESTER will again cruise the area and mark those trees selected for commercial thinning, then order this job done.

PARTICLE BOARD PLANT PROCESS FLOW CHART

1. Planer shavings are brought in from the mill on a conveyor belt. Some shavings are brought from other mills. Trimmer saw scraps from the plywood are also brought in and mixed with the planer shavings. The PREPARATION OPERATOR runs the hammer mill which grinds the particles to the proper size. He also is in charge of the drying of the particles to 12% moisture.
2. The shavings then go to the HANDYMAN who runs the machine which mixes the particles with the resin and the wax.
3. The particles then go the MAT OPERATOR where a machine spreads them out in the proper thickness for the board being made. The particles are spread on the aluminum caul to be sent into the press.
4. The PRESS OPERATOR runs the pressing machine which presses 24 mats at one time at a temperature of 370 degrees. He is also in charge of the cooling process where air is circulated around the boards for about fifteen minutes. The boards are then rough trimmed and stacked.
5. The LIFT TRUCK DRIVER then takes the stacks to the rough storage area or to the SANDERMAN.

6. The SANDERMAN operates the trimmer which cuts the boards to 4 ft. by 8 ft., and then finish sands them.
7. The TALLYMAN or STRAPPER places metal bands around the stacks and places the tally ticket on the stack.
8. The stack is then removed to the train loading dock by the LIFT TRUCK DRIVER.
9. The LABORER keeps the floors free of shavings, and fills in where needed.

Vacant jobs in the particle board plant are not filled by promotion but are bid for. The department puts a notice on the bulletin boards for three days and anyone is allowed to sign up. Then the employee with the most seniority is offered the job first. He has the right to refuse, however, whereby the job will be offered to the next in line.

FORESTERS

OCCUPATIONAL DESCRIPTION

Makes surveys of the standing timber to determine the types, ages, and health of trees through the use of helicopters, aerial photography and ground reconnaissance. Decides which stand of timber should be cut to provide the woods products demanded by the consumer. Marks trees for commercial thinning and selects areas for pre-commercial thinning. Supervises reforestation of lands that have been logged, with nursery seedlings or seeds broadcast by hand or from the air. Conducts spray programs to retard the growth of red alder to allow the douglas fir to get a start. Makes surveys to check on progress of seeded and planted areas and reseeds or replants any areas on which the new crops do not meet standards. May contract aerial spraying to kill weeds which may choke out the seedlings. Conducts helicopter fertilization operations to help increase the growth of young trees.

EQUIPMENT

Aerial photographs, cork boots, increment bore, paint gun, computer print out sheets, maps, electronic calculator, slide rule, diameter tape, abney level, elinometer, compass, hard hat, axe, flagging ribbon and rain gear.

MINIMUM QUALIFICATIONS

Education: Four year college degree in Forestry or two years Forest Technologist degree.
Training: Gets on the job training in the methods used by that company or agency plus formal or informal courses in forestry or supervisory management.

PHYSICAL DEMANDS AND WORKING CONDITIONS

The work is performed indoors and out in the weather too. The worker must be able to do a great deal of walking. Must have above average strength and endurance.

WORKER CHARACTERISTICS

Aptitudes: Average aptitudes are required in motor coordination, manual dexterity and eye-hand-foot coordination. Must enjoy working outside as well as at a desk.
Temperament: Must enjoy working alone at times and be able to make decisions accurately based on previous knowledge and information at hand. Must be able to work well with people and to communicate effectively both in writing and speaking.

CHANCES FOR PROMOTION

Foresters may serve in many different types of jobs within the woods product industry. A few examples:

- Logging Superintendent
- Woods Manager
- Timberlands Manager
- District Forester
- Area Forester
- Raw Materials Manager
- Regeneration Forester
- Forestry Research Specialist

Several foresters have risen to the vice-presidency or presidency of their companies.

ENGINEER: AXEMAN

OCCUPATIONAL DESCRIPTION

Cuts a path through the underbrush for the chaining.

EQUIPMENT

Axe, hard hat, cork boots, rain gear

MINIMUM QUALIFICATIONS

Education: No specific educational requirements, although employers prefer at least high school education.
Training: Gets on the job training.

PHYSICAL DEMANDS AND WORKING CONDITIONS

Work is performed outside in the weather. Worker is subject to hazzards from rough terrain and misuse of equipment. Must have above average strength and endurance to do the cutting and crawling over the varied terrain.

WORKER CHARACTERISTICS

Aptitudes: Average aptitudes are required in motor coordination, manual dexterity and eye-hand-foot coordination. Should possess a good sense of balance.

CHANCES FOR PROMOTION

Could be promoted to Rear Chainman.

ENGINEER: REAR CHAINMAN

OCCUPATIONAL DESCRIPTION

Holds the end of the chain nearest the Instrument Operator. Under the direct supervision of this man. Pulls the chain taut for accurate measurement.

EQUIPMENT

Chain, cork boots, rain gear

MINIMUM QUALIFICATIONS

Education: No specific educational requirements, although employers prefer at least a high school diploma.
Training: Gets on the job training.

PHYSICAL DEMANDS AND WORKING CONDITIONS

Work is performed outside in the weather on all types of terrains. Must have above average strength and endurance to be on feet and walking all day.

WORKER CHARACTERISTICS

Aptitudes: Average aptitudes are required in motor coordination, manual dexterity and eye-hand-foot coordination. Worker should possess a good sense of balance.

CHANCES FOR PROMOTION

Could be promoted to Head Chainman.

ENGINEER: HEAD CHAINMAN

OCCUPATIONAL DESCRIPTION

Is higher paid and has more experience than the Rear Chainman. Gives sights and is responsible for assuring that the chain is taut and clear of obstacles. He is often responsible for placing the next marker which will be used to measure distances and angles.

EQUIPMENT

Rain gear, axe, chain, hubs, plumb bob

MINIMUM QUALIFICATIONS

Education: No specific educational requirements, although employers prefer at least a high school diploma.
Training: Gets on the job training.

PHYSICAL DEMANDS AND WORKING CONDITIONS

Work is performed outside in the weather. Worker must walk over rough terrain.

WORKER CHARACTERISTICS

Aptitudes: Average aptitudes are required in motor coordination, manual dexterity and eye-hand-foot coordination. Should possess a good sense of balance.

CHANCES FOR PROMOTION

Could be promoted to Transit Operator or Instrument Operator.

ENGINEER: INSTRUMENT MAN
TRANSIT OPERATOR

OCCUPATIONAL DESCRIPTION

Operates the transit to measure verticle and horizontal angles. Makes notes and field computation using trigonometry. Moves the tripod to the next location for sighting and sets it up making sure that the plumb bob, magnifying telescope, and instrument protractors are set accurately.

EQUIPMENT

Tripod, transit, plumb bob, pad, pencil, field book, cork boots, rain gear

MINIMUM QUALIFICATIONS

Education: No specific educational requirements, although employers prefer at least a high school diploma.
Training: On the job training in the methods used by that company.

PHYSICAL DEMANDS AND WORKING CONDITIONS

The work is done out of doors in all types of terrain. The worker must have above average strength and endurance to handle the transit and move it from location to location.

WORKER CHARACTERISTICS

Aptitudes: Average aptitudes are required in motor coordination and eye-hand-foot coordination. Must have good math ability.
Temperament: Must not be easily discouraged by the difficulty of working in different terrains and in weather that is not always nice. Must have integrity to do accurate work at all times.

CHANCES FOR PROMOTION:

Could be promoted to Party Chief.

ENGINEER: PARTY CHIEF

OCCUPATIONAL DESCRIPTION

Worker is in charge of crew doing the survey. He has the most experience in the field and sets the pace of the crew as well as makes field computations. Receives directions from a higher authority along with a general description of the job to be done. This is the highest level a high school graduate can obtain without further education.

EQUIPMENT

Pad, pencil, rain gear.

MINIMUM QUALIFICATIONS

Education: Worker should have at least a high school diploma and have taken math through trigonometry.
Training: Has worked at most of the other jobs in the survey crew learning the methods used in that company.

PHYSICAL DEMANDS AND WORKING CONDITIONS

The worker is outside in the weather and must move over any type of terrain required to get that job done. Must have above average endurance to set the pace of the crew.

WORKER CHARACTERISTICS

Aptitudes: Above average aptitude in math and the ability to perform accurate calculations in the field. Must have the ability to direct other people's work.
Temperaments: Must be even tempered and able to cope with job difficulties caused by weather and different terrains.

CHANCES FOR PROMOTION:

The worker is as high as he can go without further education.

ROAD SURVEY TEAM
LEVELMAN

OCCUPATIONAL DESCRIPTION

Sights through the level to a point on the level rod and records the readings in the field book. From these readings he computes the elevations of the land. Usually starts from a point of known elevation.

EQUIPMENT

Level, field book, pad, pencil and rain gear

MINIMUM QUALIFICATIONS

Education: The worker should have a high school diploma and a good math background including trigonometry.
Training: Gets on the job training in the methods used by that company.

PHYSICAL DEMANDS AND WORKING CONDITIONS

The work is done totally out of doors in the weather. The worker must have above average strength and endurance to walk or climb over all types of terrains and carry his equipment. The worker is subject to no immediate danger.

WORKER CHARACTERISTICS

Aptitudes: Above average aptitude in math and the ability to perform accurate calculations in the field. Must have the ability to direct other people's work and integrity to perform the job without taking shortcuts.
Temperaments: Must not be easily defeated by the working conditions of rough terrain and weather. Must do accurate and complete work.

CHANCES FOR PROMOTION

Could be promoted to Instrument Man.

ROAD SURVEY TEAM
RODMAN

OCCUPATIONAL DESCRIPTION

Holds the level rod for the levelman at a predetermined point marked by the Transit Team. Moves the level rod from one point to the next and follows the hand signals of the levelman in placing rod in vertical position. May use an axe and hubs to mark position.

EQUIPMENT

Level, rod, axe, hubs and rain gear

MINIMUM QUALIFICATIONS

Education: The worker should have a high school diploma and a good background in math including trigonometry.
Training: Gets on the job training in the methods used by that company. Probably started as an axeman.

PHYSICAL DEMANDS AND WORKING CONDITIONS

Aptitudes: Above average aptitude in math and the ability to work somewhat on his own doing a good job without taking shortcuts.
Temperaments: Must not be easily defeated by the working conditions of rough terrain and weather.

CHANCES FOR PROMOTION

Could be promoted to Rear Chainman

LAB STATISTICIAN

OCCUPATIONAL DESCRIPTION

Collects, calculates and interprets information on rainfall, evaporation and ground absorption from the lagoon, water fed into the lagoon, and stock loss. Uses calculator to help interpret figures and plots these figures on a chart.

EQUIPMENT

Adding machine and electronic calculator, graph paper and record sheets.

MINIMUM QUALIFICATIONS

Education: At least a high school graduate, with heavy math background
Training: Will get on the job training in procedures used by that company

PHYSICAL DEMANDS AND WORKING CONDITIONS

Most of the work is done indoors in quiet surroundings. The worker is in no immediate danger and the work is not physically demanding.

WORKER CHARACTERISTICS

Aptitudes: Must be quick and accurate with math and the latest specialized statistical processes.
Temperaments: Must remain even tempered and methodical.

CHANCES FOR PROMOTION:

This is about as high as he can go.

LAB STENOGRAPHER

OCCUPATIONAL DESCRIPTION

Prepares monthly reports to go to the state on the amount of water used by the plant and what it was used for. Also types letters and other reports for mill production. Files records and technical reports as well as technical reports from outside agencies for further reference. Calculates data for reports being made up.

EQUIPMENT

Typewriter, electronic calculator

MINIMUM QUALIFICATIONS

Education: Employer prefers at least a high school diploma.
Training: Will get on the job training in procedures used by that company.

PHYSICAL DEMANDS AND WORKING CONDITIONS

The work is done indoors with no immediate danger to the worker. The work is not physically demanding.

WORKER CHARACTERISTICS

Aptitudes: The worker must have above average manual dexterity and eye-hand coordination for operation of office machinery.
Temperaments: Remain fairly even tempered and be friendly and efficient.

CHANCES FOR PROMOTION:

Has about reached his limit.

LAB TECHNICIANS

OCCUPATIONAL DESCRIPTION

Collects samples for and performs chemical type testing for BOD, temperature and PH of effluent.

EQUIPMENT

Chemical testing equipment needed to perform these tests.

MINIMUM QUALIFICATIONS

Education: Employer would prefer a high school graduate with some college
Training: On the job training in the processes used by that company

PHYSICAL DEMANDS AND WORKING CONDITIONS

Work is performed inside under quiet conditions except when collecting samples. Worker is subject to no immediate hazzards and needs only average physical strength.

WORKER CHARACTERISTICS

Aptitudes: Must do careful work utilizing small measurements.
Temperaments: Must be able to follow directions and do thorough and accurate work keeping a record of what he has done.

CHANCES FOR PROMOTION

Could possibly become statistician or transfer to another department. Otherwise he has reached his limit in this department.

TECHNICAL SUPERINTENDENT

OCCUPATIONAL DESCRIPTION:

Collects the effluent to be sent to the chemical testing company for tests of COD, total oil and grease, color and turbidity. Makes applications for outfall permits from the Federal and State Governments. Is the head man in the technical department of the mill. Supervises all workers in that department.

EQUIPMENT

Dissolved oxygen meter and other chemical testing equipment, outfall application forms

MINIMUM QUALIFICATIONS

Education: College graduation with a degree in chemical engineering
Training: Gets some training on the job as to the way things are done in the company

WORKER CHARACTERISTICS

Aptitudes: Average
Temperaments: Be able to direct work of others. Should be even tempered.

PHYSICAL DEMANDS AND WORKING CONDITIONS

Most of the work is done inside. The worker is subject to no immediate hazzards. Needs only average strength and endurance.

CHANCES FOR PROMOTION

Could be promoted to mill manager or pulp mill superintendent.

PREPARATION OPERATOR

OCCUPATIONAL DESCRIPTION

In charge of the hammer mill which mills the planer shavings to the proper size. In charge of the blowers and tunnels which dry the shavings to the proper moisture content.

EQUIPMENT

Hammer mill, drying equipment

MINIMUM QUALIFICATIONS

Education: Preferably a high school education
Training: Gets five days on the job training before beginning on his own

WORKER CHARACTERISTICS

Aptitudes: Average - some mechanical
Temperaments: Even tempered

PHYSICAL DEMANDS AND WORKING CONDITIONS

All of the work is done inside under rather noisy conditions, and is subject to slippery shavings on the floor and climbing around high places.

HANDYMAN

OCCUPATIONAL DESCRIPTION

Mixes the resin and the wax with the shavings. Responsible for the vats which hold the resin and wax and also the blending chambers. Must know the jobs of the MAT OPERATOR and the PRESS MAN because he relieves them for their breaks.

EQUIPMENT

Slide rule is helpful, several chemical mixing machines, as well as the mat former and the pressing machine.

MINIMUM QUALIFICATIONS

Education: High school diploma preferred
Training: Gets five on the job training days before he takes over the job

WORKER CHARACTERISTICS

Aptitudes: Some math and mechanical ability
Temperaments: Average

PHYSICAL DEMANDS AND WORKING CONDITIONS

Indoors all the time. Occasionally the odor of the chemicals is annoying. The noise is quite loud. Needs only average strength and endurance.

MAT OPERATOR

OCCUPATIONAL DESCRIPTION

Runs the machine which forms the shavings into a 51" x 101" mat on an aluminum caul the same size. Must carefully control the thickness and the weight of the mat, and make any necessary adjustments on the machines.

EQUIPMENT

Operates the mat former, slide rule is helpful

MINIMUM QUALIFICATIONS

Education: High school diploma preferred. Some math background
Training: Given five days on the job training before beginning on his own

WORKER CHARACTERISTICS

Aptitudes: Some math and mechanical ability
Temperaments: Average

PHYSICAL DEMANDS AND WORKING CONDITIONS

All the work is done inside and is quite noisy. The machinery can be dangerous. Needs only average strength and endurance.

PRESS OPERATOR

OCCUPATIONAL DESCRIPTION

Runs the particle board press which presses the mats into boards at a temperature of 370 degrees. Also operates the cooling machine after the boards come out of the press. Operates the rough trimming saw after the boards are cooled.

EQUIPMENT

Pressing machine, cooling machine, trimmer saw

MINIMUM QUALIFICATIONS

Education: High school diploma preferred
Training: Five days on the job training is given before starting to work

WORKER CHARACTERISTICS

Aptitudes: Some mechanical
Temperaments: Can stand repetitious work

PHYSICAL DEMANDS AND WORKING CONDITIONS

All the work is inside. It is noisy and the machines can be dangerous if one is careless.

LIFT TRUCK DRIVER

OCCUPATIONAL DESCRIPTION

Operates the lift truck or hyster to take loads of particle board from the pressing machine to rough storage or the sander. Then he takes the finished board from the TALLYMAN to the rail loading dock.

EQUIPMENT

Fork lift truck (hyster), ear muffs

MINIMUM QUALIFICATIONS

Education: High school diploma preferred
Training: Five days on the job training before beginning the job

WORKER CHARACTERISTICS

Aptitudes: Mechanical - driving ability
Temperaments: Even tempered and can take repetitious work

PHYSICAL DEMANDS AND WORKING CONDITIONS

All the work is done inside and it is noisy. The driving can be dangerous if one is careless.

SANDERMAN

OCCUPATIONAL DESCRIPTION

Operates the sander and the end and side trimmer saws. Replaces the sanding belt and makes adjustments on the saws. Runs the grading and stamping machine.

EQUIPMENT

Large trimmer saws and stationary sander

MINIMUM QUALIFICATIONS

Education: High school diploma preferred
Training: Five days on the job training before beginning the job

WORKER CHARACTERISTICS

Aptitudes: Mechanical
Temperaments: Be able to work alone on a repetitious job.

PHYSICAL DEMANDS AND WORKING CONDITIONS

All the work is done inside. The noise is loud, and the machinery can be dangerous if one is careless.

TALLYMAN or STRAPPER

OCCUPATIONAL DESCRIPTION

Wraps metal straps around the stacks and places the tally ticket on each stack. Occasionally helps Sanderman.

EQUIPMENT

Tool for binding and crimping the straps, tally tickets

MINIMUM REQUIREMENTS

Education: High school diploma preferred
Training: Five days on the job training before beginning the job

WORKER CHARACTERISTICS

Aptitudes: Some mechanical ability
Temperaments: Be able to work alone under repetitious conditions

PHYSICAL DEMANDS AND WORKING CONDITIONS

All work is inside. It is noisy and can be dangerous if one is careless.